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| EXAMINER | |
|---|---|
| WRIGHT, KAINOA | |

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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/815,593 | HANSEN ET AL. | |
| | Examiner | Art Unit | |
| | Kainoa BK Wright | 2861 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *01 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 April 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/12/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Drawings*

1. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because drawings fail to comply with 37 CFR 1.84 (c), (g) and (l). Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 26 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim states that the controller employs a PID loop to drive the microlaser, however; the depended upon claim 25 states that the controller, and thus the PID, drives the cooling system. In accordance with the entirety of the disclosure, wherein the PID is part of the temperature control, it will be assumed for the purposes of examination, that claim 26 is meant to direct the PID towards the operation of the cooling system and claim 26 will be examined as such.

### *Claim Objections*

4. Claim 17 is objected to because of the following informalities: Lines 2-3 of claim 17 reads "movable to vary the distance between said platen and said at least a portion of said guidance distance". It is clear that "distance" should read "system" as there is no guidance distance mentioned and only a guidance system. The claim will be examined as such. Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claim 28 is rejected under 35 U.S.C. 102(e) as being anticipated by Kan et al. (2003/0138005).

Kan et al. teaches a laser driven at a level at or beneath a saturation threshold. Kan et al. further teaches an increase in power to drive the laser above the threshold in order to emit a controlled laser pulse (Figures 2A-2E). Determination of when a pulse is required is inherent in the operation and purpose of Kan et al. The entire reason for maintaining the power at a below saturation level is in order to fire a laser pulse at will.

The increase in power is supplied at need, implying that an operator is free to determine that need and subsequently increase the power to generate a laser pulse.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-4 and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kan et al. (2003/0138005) in view of Chiba et al. (US 6144397).

Kan et al. teaches a laser driven at a level at or beneath a saturation threshold. Kan et al. further teaches an increase in power to drive the laser above the threshold in order to emit a controlled laser pulse (Figures 2A-2E). Kan et al. further teaches the repetition of this cycle (paragraph [0044]). Further, it is extremely well known to use a laser to emit a high power pulse in a direction towards a target media for the purposes of marking.

Kan et al. fails to teach a specific means for directing the laser pulse towards a target media.

Regarding Claim 2: Chiba et al. further teaches directing the laser pulse towards along a path (Figure 1).

Regarding Claims 3 and 4: Chiba et al. further teaches directing the laser pulse with at least one mirror 4 (Figure 1) which is pivotally mounted (column 9, lines 11-16).

Regarding Claim 6: Chiba et al. further teaches feeding the target 10 into the path of the laser pulse (column 9, lines 45-46).

Regarding Claims 7 and 8: Kan et al. provides for the laser medium to be in a saturated state at or below a predetermined value. This value is arbitrary and can be the threshold of the medium or any percentage of it. It is clear from the Figures 2A-2E, that Kan et al. provides for a hold level of at least 50% of TH (or the threshold). It is also evident in Fig 2D, that the curve corresponding to the holding level is asymptotically approaching TH and thereby would constitute a hold level of at least 90% of TH.

Regarding Claim 9: Kan et al. provides for the laser to be passively Q-switched (paragraphs [0005] and [0026]).

Regarding Claims 2-4 and 6-9: It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the marking laser of Kan et al. in combination with any marking system where there is a means for directing such a laser pulse towards a target media to be marked, such as the directing means provided by Chiba et al., in order to provide for an obvious means to carry out the inherent marking function of the laser of Kan et al. and to also provide the marking system of Chiba et al. with a laser source capable of a faster rate of fire and greater timing precision and control.

9. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kan et al. in view of Miyagawa et al. (US 5588724).

Kan et al. teaches a laser driven at a level at or beneath a saturation threshold. Kan et al. further teaches an increase in power to drive the laser above the threshold in order to emit a controlled laser pulse (Figures 2A-2E). Kan et al. further teaches the repetition of this cycle (paragraph [0044]). Further, it is extremely well known to use a laser to emit a high power pulse in a direction towards a target media for the purposes of marking.

Kan et al. fails to teach a specific means for directing the laser pulse towards a target media.

Miyagawa et al. teaches directing light from a laser light source (column 5, lines 36-47) through a fiber optic guide 28 to mark a target media 42 (Figure 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the marking laser of Kan et al. in combination with any marking system where there is a means for directing such a laser pulse towards a target media to be marked, such as the directing means provided by Miyagawa et al., in order to provide for an obvious means to carry out the inherent marking function of the laser of Kan et al. and to also provide the marking system of Miyagawa et al. with a laser source capable of a faster rate of fire and greater timing precision and control.

10. Claims 10-12 and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kan et al. (2003/0138005) in view of Miyagawa et al. (US 5588724).

Kan et al. teaches a passively Q-switched laser driven at a level at or beneath a saturation threshold. This value is arbitrary and can be the lasing threshold of the

medium or any percentage of it. It is clear from the Figures 2A-2E, that Kan et al. provides for a hold level of at least 50% of TH (or the lasing threshold). It is also evident in Fig 2D, that the curve corresponding to the holding level is asymptotically approaching TH and thereby would constitute a hold level of at least 90% of TH. Kan et al. further teaches an increase in power to drive the laser above the threshold in order to emit a controlled laser pulse (Figures 2A-2E), whereby the saturation level is controlled by a controller (42 & 50). Kan et al. further teaches the repetition of this cycle (paragraph [0044]). Further, it is extremely well known to use a laser to emit a high power pulse in a direction towards a target media for the purposes of marking.

Kan et al. fails to teach a specific guidance means for directing the laser pulse towards a target media.

Miyagawa et al. teaches a guidance means for directing light from a laser light source (column 5, lines 36-47) through a fiber optic guide 28 to mark a target media 42 (Figure 2), wherein the fiber optics have an input end receiving the light and an output end through which the light exits, the output end being mounted to a movable carriage 10 (column 5, lines 15-17).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the marking laser of Kan et al. in combination with any marking system where there is a means for directing such a laser pulse towards a target media to be marked, such as the directing means provided by Miyagawa et al., in order to provide for an obvious means to carry out the inherent marking function of the laser of

Kan et al. and to also provide the marking system of Miyagawa et al. with a laser source capable of a faster rate of fire and greater timing precision and control.

11. Claims 10 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kan et al. (2003/0138005) in view of Chiba (US 6144397).

Kan et al. teaches a passively Q-switched laser driven at a level at or beneath a saturation threshold. Kan et al. further teaches an increase in power to drive the laser above the threshold in order to emit a controlled laser pulse (Figures 2A-2E), whereby the saturation level is controlled by a controller (42 & 50). Kan et al. further teaches the repetition of this cycle (paragraph [0044]). Further, it is extremely well known to use a laser to emit a high power pulse in a direction towards a target media for the purposes of marking.

Kan et al. fails to teach a specific guidance means for directing the laser pulse towards a target media.

Chiba et al. teaches a guidance means for directing light from a laser light source 1 to mark a target media 10 (Figure 1), wherein the guidance means comprises at least one mirror 4 which is rotatable.

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the marking laser of Kan et al. in combination with any marking system where there is a means for directing such a laser pulse towards a target media to be marked, such as the directing means provided by Chiba et al., in order to provide for an obvious means to carry out the inherent marking function of the laser of Kan et al.

and to also provide the marking system of Chiba et al. with a laser source capable of a faster rate of fire and greater timing precision and control.

12. Claims 10 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kan et al. (2003/0138005) in view of Ohba (US 6559880).

Kan et al. teaches a passively Q-switched laser driven at a level at or beneath a saturation threshold. Kan et al. further teaches an increase in power to drive the laser above the threshold in order to emit a controlled laser pulse (Figures 2A-2E), whereby the saturation level is controlled by a controller (42 & 50). Kan et al. further teaches the repetition of this cycle (paragraph [0044]). Further, it is extremely well known to use a laser to emit a high power pulse in a direction towards a target media for the purposes of marking.

Kan et al. fails to teach a specific guidance means for directing the laser pulse towards a target media. Kan further fails to teach a media feed assembly as a platen supporting the target and feeding the target into the laser path, wherein at least one of the paten and a portion of the guidance means is movable to vary the distance between the platen and the guidance system.

Ohba teaches a laser marking system comprising an optical system 126, the optical system comprising a series of lenses capable of guiding laser light onto a target media 12. Ohba further teaches the target fed into the laser path by a feed assembly 54. Ohba further teaches the distance between the feed assembly and the laser

guidance system 126 to be adjustable by movement of the guidance system via moving the exposure head 92 (column 9, lines 39-42).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the marking laser of Kan et al. in combination with any marking system where there is a means for guiding such a laser pulse towards a target media to be marked, such as the guiding means provided by the lenses and the distance adjustment mechanism of Ohba, in order to provide for an obvious means to carry out the inherent marking function of the laser of Kan et al. and to also provide the marking system of Ohba with a laser source capable of a faster rate of fire and greater timing precision and control.

13. Claims 10 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kan et al. (2003/0138005) in view of Kitai et al.(US 5990596).

Kan et al. teaches a passively Q-switched laser driven at a level at or beneath a saturation threshold. Kan et al. further teaches an increase in power to drive the laser above the threshold in order to emit a controlled laser pulse (Figures 2A-2E), whereby the saturation level is controlled by a controller (42 & 50). Kan et al. further teaches the repetition of this cycle (paragraph [0044]). Further, it is extremely well known to use a laser to emit a high power pulse in a direction towards a target media for the purposes of marking.

Kan et al. fails to teach a specific guidance means for directing the laser pulse towards a target media. Kan et al. further fails to teach a guidance system wherein the

system includes a carriage movable relative to an optical output and wherein the carriage supports a structure to direct a pulse of light towards a target media.

Kitai et al. teaches a guidance means for directing light from a laser light source 305 towards a target media 9c wherein the guidance means comprises an optical head 301 movable relative to an optical output (Figure 7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the marking laser of Kan et al. in combination with any marking system where there is a means for directing such a laser pulse towards a target media to be marked, such as the directing means provided by Kitai et al., in order to provide for an obvious means to carry out the inherent marking function of the laser of Kan et al. and to also provide the marking system of Kita et al. with a laser source capable of a faster rate of fire and greater timing precision and control.

14. Claims 10 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kan et al. (2003/0138005) in view of Corbett (US 6113992).

Kan et al. teaches a passively Q-switched laser driven at a level at or beneath a saturation threshold. Kan et al. further teaches an increase in power to drive the laser above the threshold in order to emit a controlled laser pulse (Figures 2A-2E), whereby the saturation level is controlled by a controller (42 & 50). Kan et al. further teaches the repetition of this cycle (paragraph [0044]). Further, it is extremely well known to use a laser to emit a high power pulse in a direction towards a target media for the purposes of marking.

Kan et al. fails to teach a specific guidance means for directing the laser pulse towards a target media. Kan et al. further fails to teach a platform for supporting a target media, the platform having at least one degree of freedom.

Corbett teaches target 12 on platform 11, the platform having a degree of freedom being along the axis of the guide 14. Corbett also teaches a means for guiding the laser light by stating that "the laser 28 projects a movable laser beam 52," the means for guiding directing the beam towards target (column 6, lines 45-50).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the marking laser of Kan et al. in combination with any marking system where marking is accomplished with a laser, such as the system of Corbett, in order to provide for an obvious means to carry out the marking function of the laser of Kan et al. and to also provide the marking system of Corbett with a laser source capable of a faster rate of fire and greater timing precision and control.

15. Claims 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kan et al. (2003/0138005) in view of Miyagawa et al. (US 5588724) as applied to claim 10 above, and further in view of Endo (US 6030133).

Kan et al. in view of Miyagawa et al. teach a passively Q-switched laser driven at a level at or beneath a saturation threshold. Kan et al. in view of Miyagawa et al. further teaches an increase in power to drive the laser above the threshold in order to emit a controlled laser pulse, whereby the saturation level is controlled by a controller. Kan et

al. in view of Miyagawa et al. further teaches a guidance means for directing light from a laser light source towards a target media.

Kan et al. in view of Miyagawa et al. fails to teach the control circuitry for controlling the laser disposed in an electrical enclosure separate from a printing enclosure housing the guidance mechanism. Kan et al. in view of Miyagawa et al. further fails to teach the enclosures sharing a common wall.

Endo teaches a control circuit board 92 for controlling printing to be housed within a separate housing than the printing means (column 5, lines 55-65) and that they share a common wall, that wall being the bottom of the printer housing. Endo further teaches that the printing means be a laser type printing (column 6, lines 55-60).

Kan et al. in view of Miyagawa et al. being representative of the laser printing types known in the art to print using a pulses of lasers, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the laser printing system of Kan et al. in view of Miyagawa et al. in combination with the dual enclosure setup of Endo in order to provide for a removable and/or replaceable printing means from a common control circuitry, as suggested by Endo.

16. Claims 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kan et al. (2003/0138005) in view of Miyagawa et al. (US 5588724) as applied to claim 10 above, and further in view of Miguelez et al. (2003/0063637).

Kan et al. in view of Miyagawa et al. teach a passively Q-switched laser driven at a level at or beneath a saturation threshold. Kan et al. in view of Miyagawa et al. further

teaches an increase in power to drive the laser above the threshold in order to emit a controlled laser pulse, whereby the saturation level is controlled by a controller. Kan et al. in view of Miyagawa et al. further teaches a guidance means for directing light from a laser light source towards a target media.

Kan et al. in view of Miyagawa et al. fails to teach the control circuitry further capable of driving a cooling system and monitoring a temperature. Kan et al. in view of Miyagawa et al. further fails to teach the controller using a PID loop to maintain the temperature.

Miguelez et al. teaches control circuitry capable of monitoring and controlling a temperature of a laser by using a PID in order to keep the laser within a desired level (paragraph [0030]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include the temperature control of Miguelez et al. within the laser marking system of Kan et al. in view of Miyagawa et al. in order to keep the temperature of the laser within a most desirable operating range, as suggested by Miguelez et al.

17. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kan et al. (2003/0138005) in view of Miyagawa et al. (US 5588724) in further view of Miguelez et al. (2003/0063637) as applied to claim 25 above, and still further in view of Richardson et al. (2003/0156605).

Kan et al. in view of Miyagawa et al. in further view of Miguelez et al. teaches a laser control capable of monitoring and controlling a temperature of the laser system.

Kan et al in view of Miyagawa et al. in further view of Miguelez et al. also teaches the control of pulse emission timing by keeping the laser at a power under a saturation threshold until additional power is applied and lasing is induced.

Kan et al. in view of Miyagawa et al. in further view of Miguelez et al. fail to teach a photodiode providing feedback to the controller in order to monitor laser repetition rate.

Richardson et al. teaches the use of a fast photodiode to monitor the repetition rate of a pulsed laser in order to control the fire timing (paragraph [0110]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kan et al. in view of Miyagawa et al. in further view of Miguelez et al. to include the repetition rate monitoring technique of Richardson et al. in order to provide a means for verifying and adjusting a pulse fire timing.

18. Claims 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kan et al. (2003/0138005) in view of Miguelez et al. (2003/0063637).

Kan et al. teaches a passively Q-switched laser driven at a level at or beneath a saturation threshold. Kan et al. further teaches an increase in power to drive the laser above the threshold in order to emit a controlled laser pulse (Figures 2A-2E), whereby the saturation level is controlled by a controller (42 & 50).

Kan et al. fails to teach the monitoring and maintaining of an optimal value of a temperature of the laser. Kan et al. further fails to teach using a PID to maintain temperature.

Miguelez et al. teaches control circuitry capable of monitoring and controlling a temperature of a laser by using a PID in order to keep the laser within a desired level (paragraph [0030]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include the temperature control of Miguelez et al. within the laser marking system of Kan et al. in order to keep the temperature of the laser within a most desirable operating range, as suggested by Miguelez et al.

19. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kan et al. (2003/0138005) in view of Richardson et al. (2003/0156605).

Kan et al. teaches a passively Q-switched laser driven at a level at or beneath a saturation threshold. Kan et al. further teaches an increase in power to drive the laser above the threshold in order to emit a controlled laser pulse (Figures 2A-2E), whereby the saturation level is controlled by a controller (42 & 50).

Kan et al. fails to teach monitoring a laser repetition rate using a photodiode.

Richardson et al. teaches the use of a fast photodiode to monitor the repetition rate of a pulsed laser in order to control the fire timing (paragraph [0110]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kan et al. in view of Miyagawa et al. in further view of Miguelez et al. to include the repetition rate monitoring technique of Richardson et al. in order to provide a means for verifying and adjusting a pulse fire timing.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kainoa BK Wright whose telephone number is (571) 272-5102. The examiner can normally be reached on M-F 8:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vip Patel can be reached on (571) 272-2458. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KAI
7/21/2006

HAI PHAM
PRIMARY EXAMINER